REMARKS

Claims 1-6, 8-9, 13, 15-16, 19, and 20 all the claims pending in the application, stand rejected on prior art grounds. Claims 8 and 19 stand objected upon informalities. In addition, the drawings and specification are objected to. Applicants herein affirm election of invention I defined by claims 1-9, 13-16, and 19-26, which were provisionally elected without traverse on December 14, 2004. As such, claims 10-12 and 17-18 are herein cancelled without prejudice or disclaimer. Furthermore, claims 7 and 14 are also herein cancelled without prejudice or disclaimer. Applicants respectfully traverse the objections/rejections of the claims based on the following discussion.

I.   The Objections to the Drawings

The drawings are objected to because FIG. 3 includes "Level 2b Aggregator" corresponding to reference characters 324 and 326. Accordingly, FIG. 3 has been amended to provide "Level 2a Aggregator/Local Decision Maker" corresponding to reference character 324 and "Level 2b Aggregator" to remain corresponding to reference character 326. The drawings are also objected to because the text of block 420 in FIG. 4 does not match the description in the specification. Accordingly, the text of block 420 in FIG. 4 is amended to replace ">" with "<" in accordance with the description in the specification. Thus, replacement sheets for FIGS. 3 and 4 are concurrently submitted herewith correcting the errors noted in the Office Action. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the drawings.

II.   The Objections to the Specification

The abstract of the disclosure is objected to because the length exceeds 150 words. Accordingly, the abstract has been amended to comply with MPEP §608.01(b) such that the total number of words no longer exceeds 150 words (amended abstract is 130 words in length). In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the specification.

III.   The Objections to the Claims

Claims 8 and 19 are objected to because of informalities. However, contrary to the assertion in the Office Action, claim 8 is correct as written and does not contain a typographical error. Indeed, "...predetermined information that correlates changes in request rates with charges in the corresponding number of <u>application</u> instances of said one or more resource classes required to service said request rates" is correct as the claimed invention associates actual charges to the changes in request rates. With respect to claim 19, Applicants have amended claim 19 in accordance with the suggestion in the Office Action to include the word "comprising" after the word "system" in the preamble. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the claims.

IV.   The Prior Art Rejections

Claims 1-3, 5-6, 9, 13, 15-16 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Goyal (U.S. Patent No. 6,711,607) in view of Sharma et al. (U.S. Patent No. 6,182,109), hereinafter referred to as "Sharma". Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Goyal and Sharma, in further view of Official Notice. Claims 7-8 and

09/921,868   14

14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Goyal and Sharma, in further view of Al-Hilali et al. (U.S. Patent No. 6,086,618), hereinafter referred to as "Al-Hilali". Applicants respectfully traverse these rejections based on the following discussion.

Goyal discloses a multi-resource system dynamically allocating its resources amongst multiple task streams to provide quality of service guarantees to the task streams. A quality of service manager maintains quality of service requirement information for a plurality of task streams, and requests processing of received tasks. An arbitrator assigns tasks streams and their tasks amongst various servers providing access to resources. The assignment is such that the total quality of service guarantees of the task streams assigned to each server does not exceed the total availability or capacity of the resource. When all assigned tasks for a server are blocked, the server notifies the arbitrator, which transfers an unblocked task to it. When a blocked task unblocks on a server handling a transferred task, the arbitrator transfers back the previously transferred task to its originating server.

Sharma discloses a method, system, and product for dynamically managing a pool of execution units in a server system, the pool devoted to a communication process between client and server processes. A minimum and a maximum number of execution units in the communication process pool is established. The minimum number of execution units is the number necessary to support a typical client load. The maximum number of execution units is an upper bound to support a peak client load without overloading the server system. As client requests for service are received by the server system, a number of determinations are made: It is determined whether assigning an execution unit to the request would bring a current number of execution units in the communication process pool over the maximum number of execution units. If so, the client request is rejected. It is determined whether assigning an execution unit to

09/921,868   15

the request would bring the number of assigned execution units to a client task making the request over an allotted number of execution units for the client task. If so, the client request is rejected. The client request if the determinations are negative thereby assigning an execution unit in the communication process pool to the client request. The number of unused execution units in the communication pool is periodically reviewed to determine whether it should be increased or decreased to improve system performance.

Al-Hilali discloses a method for developing system resource usage "cost" equations, creating models based upon such cost equations, and estimating total system resource usage and computer program product incorporating such cost equations. A server application is analyzed and certain transactions are defined therein that occur in response to interaction with a client application that in many instances originates from user behavior. System resources are also identified and resource usage measurements are determined for each transaction. One way of determining the resource usage measurements is by creating a load of a particular transaction on an "instrumented" server application and measuring the resources used in connection with the transaction. Cost equations for each type of system resource can then be constructed taking a component from each transaction that uses a particular system resource so that the cost equations are defined in terms of transactions. By reducing user behavior to transactions, accurate estimates of total hardware resource usage for a server application in a particular scenario can be easily attained.

However, amended independent claims 1, 15, and 16 now include the limitations of original dependent claim 7 (now cancelled without prejudice or disclaimer) and as such generally provide, in part, "maintaining a record of the current rate of requests received from respective application-level users, based on the monitored number of serviced requests; and collectively and

automatically allocating fractions of different resource class components to a particular

application-level user in response to the increased or decreased number of application instances

of one or more resource class components." Additionally, amended independent claims 13, 19,

and 20 now include the limitation of original dependent claim 14 (now cancelled without

prejudice or disclaimer) and as such generally provide, in part, "adjusting the respective numbers

of said one or more application instances of each resource class component; and collectively and

automatically allocating fractions of different resource class components to a particular

application-level user in response to a fluctuating number of application instances of one or more

resource class components, wherein said application instances of each resource class component

are adjusted for each application-level user based (i) at least partly on said records of resources

currently available and currently consumed by respective application-level users, and (ii) at least

partly on predetermined information that estimates the number of each resource class

components required to service requests for said application instances of the resource class

components."

Clearly, these features are not taught or suggested in the combination of Goyal, Sharma,

and Al-Hilali. Furthermore, the amended independent claims 1, 13, 15, 16, 19, and 20

specifically refer to "application-level users" and "application instances", which further

differentiates the claimed invention from the non-application-level users and non-application

instances in Goyal, Sharma, and Al-Hilali as further discussed below. The Applicants'

specification (page 1 and 2) describes the system taught in Goyal as well as some of its

deficiencies, which the Applicants' claimed invention overcomes. Ensim Corporation of

Sunnyvale California is the assignee of the Goyal patent. In particular, page 1 and 2 of the

Applicants' specification provides:

An improved arrangement has been proposed by Ensim Corporation of Sunnyvale, California. This proposed arrangement provides application hosting using the concept of machine fractions. Ensim's solution allows ASPs to securely share server resources between customers, as well as manage the deployment of applications across the server farm by supporting what are termed private servers (PSs). Each PS can run any off-the-shelf applications supported on the physical server. The Ensim system also offers management primitives for recovering failed PSs, migrating customers across PSs and machines, and increasing PS resources manually. From a single console, ASPs can provision and manage multiple PSs. The applications to be hosted need only be web-hosting ready, and do not need any further modifications.

Despite various advantages, the arrangement proposed by Ensim has various limitations. The PSs are relatively static in the sense that each PS guarantees a minimum availability of physical server resources. As a result, the solution provided by Ensim is still relatively inefficient in its use of resources. Also, system management must be done manually, via a console.

The resource abstraction used in the Applicants' claimed invention is patentably distinct from that used by each of Goyal, Sharma, and Al-Hilali. The Applicants' resource abstraction, referred to as the "Virtual Server", is defined at the business application level (e.g. retail store) which is then broken down into application level components such as commerce servers, database servers, etc. (refer to page 6 of Applicants' specification). The service level agreement (SLA) is specified by the customer at the business/application level (e.g. minimum and maximum number of hits to the retail stores per minute). The SLA is then mapped to actual application instances required. Then, the Applicants' invention dynamically and automatically (i.e., without manual intervention as in Goyal) allocates application level resources in accordance with the SLA.

Conversely, Goyal uses hardware/system level resource abstraction such as CPU, memory, disk, etc. (see column 2, lines 36-39 of Goyal). The quality of service is defined in

terms of percentage of resources (CPU) dedicated to a particular task streams (column 1, line 25-30 of Goyal). Moreover, Goyal provides a scheduling system and methodology to guarantee a quality of service to various task streams being served by multiple processors in parallel (column 2, line 31-34 of Goyal).

Sharma uses the notion of an <u>execution unit</u> as the resource abstraction which corresponds to the operating system level thread (column 21, line 22-37 of Sharma). As such, the allocation and de-allocation of resources is in terms of threads rather than application level resources as in the Applicants' claimed invention. Al-Hilali teaches the estimation of hardware and software resources needed for a server application given the anticipated number of users (column 1, line 10-12 of Al-Hilali). The different resources monitored are system level hardware resources such as CPU usage, disk access time, memory usage, etc. Conversely, the Applicants' claimed system monitors the number of requests served by the application components and allocates application instances in terms of number of requests to be served.

The SLAs are specified in business level metrics which can be more easily mapped to application level metrics than to system level metrics. As such, the Applicants' claimed invention gives a complete end to end system for managing ASPs resources. Furthermore, the system provided by the Applicants' claimed invention optimizes the use of ASPs resources while satisfying the requirements of different customers, which Goyal, Sharma, nor Al-Hilali do.

MPEP §2144.03 provides that an "examiner may take official notice of facts outside of the record which are capable of instant and unquestionable demonstration as being 'well-known' in the art," quoting *In re Ahlert*, 424 F.2d 1088, 165 USPQ 418, 420 (CCPA 1970). However, Applicants challenge how well-known it is that requests from application-level users to use the application be stored in a queue for execution by a particular application instance of the

appropriate resource class on a first-in-first-out basis as in the claimed invention. Therefore, Applicants respectfully make a demand for evidence which supports the proposition asserted in the Office Action as to the whether the above-identified elements are in fact well-known. MPEP §2144.03 goes on to indicate that "assertions of technical facts in areas of esoteric technology must always be supported by citation of some reference work" and "allegations concerning specific 'knowledge' of the prior art, which might be peculiar to a particular art should also be supported." The Applicants suggest that the claimed invention may constitute esoteric technology, and as such requires support by citation of some reference work by the Examiner. Moreover, MPEP §2144.03 further states that "[t]he facts so noticed serve to 'fill the gaps' which might exist in the evidentiary showing and should not comprise the principle evidence upon which a rejection is based." Applicants suggest that the Office Action has used the so-called well-known facts as the principle evidence to make its rejection and not merely to "fill the gaps".

Insofar as references may be combined to teach a particular invention, and the proposed combination of Goyal with Sharma and Al-Hilali, case law establishes that, before any prior-art references may be validly combined for use in a prior-art 35 U.S.C. § 103(a) rejection, the individual references themselves or corresponding prior art must suggest that they be combined.

For example, in In re Sernaker, 217 USPQ 1, 6 (C.A.F.C. 1983), the court stated: "[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings." Furthermore, the court in Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 USPQ 2d 1434 (C.A.F.C. 1988), stated, "[w]here prior-art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. . . . Something in the prior art must suggest the

09/921,868   20

desirability and thus the obviousness of making the combination."

In the present application, the reason given to support the proposed combination is improper, and is not sufficient to selectively and gratuitously substitute parts of one reference for a part of another reference in order to try to meet, but failing nonetheless, the Applicant's novel claimed invention. Furthermore, the claimed invention, as amended, meets the above-cited tests for obviousness by including embodiments such as collectively and automatically allocating fractions of different resource class components to a particular application-level user in response to a fluctuating number of application instances of one or more resource class components. As such, all of the claims of this application are, therefore, clearly in condition for allowance, and it is respectfully requested that the Examiner pass these claims to allowance and issue.

As declared by the Federal Circuit:

> In proceedings before the U.S. Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fritch, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992) citing In re Fine, 5 USPQ 2d 1596, 1598 (Fed. Cir. 1988).

Here, the Examiner has not met the burden of establishing a prima facie case of obviousness. It is clear that, not only does Goyal fail to disclose all of the elements of the claims of the present invention, particularly, the application-level users and application instances, as discussed above, but also, if combined with Sharma and Al-Hilali, fails to disclose these elements as well. The unique elements of the claimed invention are clearly an advance over the prior art.

The Federal Circuit also went on to state:

The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. . . . Here the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. Fritch at 1784-85, citing In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Here, there is no suggestion that Goyal, alone or in combination with Sharma and Al-Hilali teaches a method and system containing all of the limitations of the claimed invention. Consequently, there is absent the "suggestion" or "objective teaching" that would have to be made before there could be established the legally requisite "prima facie case of obviousness."

In view of the foregoing, the Applicants respectfully submit that the cited prior art references, Goyal, Sharma, and Al-Hilali do not teach or suggest the features defined by amended independent claims 1, 13, 15, 16, 19, and 20 and as such, claims 1, 13, 15, 16, 19, and 20 are patentable over Goyal alone or in combination with the asserted so-called well-known facts taken as Official Notice and Sharma and Al-Hilali. Further, dependent claims 2-6, 8, and 9 are similarly patentable over Goyal alone or in combination with the asserted so-called well-known facts taken as Official Notice and Sharma and Al-Hilali, not only by virtue of their dependency from patentable independent claims, respectively, but also by virtue of the additional features of the invention they define. Thus, the Applicants respectfully request that these rejections be reconsidered and withdrawn.

Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

V. Formal Matters and Conclusion

With respect to the objections to the specifications and claims, the specification and claims have been amended, above, to overcome these objections. With respect to the objection to the drawings, Replacement Sheets are submitted herewith. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the specification, claims and drawings.

In view of the foregoing, Applicants submit that claims 1-6, 8-9, 13, 15-16, 19, and 20, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

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IN THE DRAWINGS:

Replacement sheets for FIGS. 3 and 4 are being submitted currently herewith. Please replace

these figures for the corresponding figures originally submitted with the application.